

The KVM (keyboard-video-mouse) connections from each server appliance 102 are provided to a switch 104, which is itself connected to a keyboard 106, a mouse 108, and a video terminal 110. Using the arrangement, the network administrator can transmit and receive console interactions to/from each of the server appliances 102 by appropriate setting of switch 104.

Please replace the paragraph beginning at page 2, line 13, with the following:

a²
An important goal in the design of any server appliance is to minimize the cost of the system and to make it easy to set up and operate. Additionally, for systems such as the systems described herein, which are intended to be aggregated in large numbers, it is highly desirable to minimize the overall cost of the cluster by reducing or eliminating the amount of supporting hardware required.

Please replace the paragraph beginning at page 2, line 18, with the following:

a³
One of the sources of cost and complexity in current server appliances is the extra cabling and switching required to provide console access to the server. This extra cabling can become a major issue in server farm environments where large numbers of server appliances are congregated together in a single rack or set of racks. Therefore, it would be highly desirable to provide a system and method for transmitting console traffic to selected server appliances without requiring additional cabling and other hardware. It would be further desirable if the implemented solution leveraged, to the extent possible, existing features of the network to minimize the cost and complexity of implementing the invention.

Please replace the paragraph beginning at page 2, line 29, with the following:

a⁴
The problems identified above are in large part addressed by a system and method in which console interactions are communicated to and from network server appliances over the network to which the servers are connected. In one embodiment, the system includes a server appliance having software, firmware, hardware, or a combination thereof, that is configured to re-direct serial port interactions to a network port. The server appliance includes a mechanism for transmitting and receiving console data and control information via the network. The system further includes means for accepting and displaying console traffic that is sent over the network

by a server appliance and transmitting commands entered by a user back to the server appliance for processing.

Please replace the paragraph beginning at page 3, line 7, with the following:

Q⁵ In one embodiment, the firmware of the server appliance is enabled to capture console interactions directed to one of the server appliance's serial ports and re-direct these interactions over the network. The firmware of the server appliance may use existing firmware features, such as the network features of DHCP support, to transmit and receive the console traffic via the network. Another system attached to the network is configured to receive the console interactions from the network and display them on a directly attached console device. This system may include an application that uses network interactions similar to Telnet to receive console interactions from the network, and serial line communications features similar to a serial terminal emulator such as the Minicom emulator. In one embodiment, this application is configured to display multiple windows, where each window displays the console communications of a corresponding server appliance.

Please replace the paragraph beginning at page 7, line 4, with the following:

Q⁶ As depicted in FIG 3, system 300 further includes a console server 320 that provides console support for each server appliance 200 connected to the network. Console server 320 typically includes its own network interface card 321 through which IP formatted packets with the appropriate destination IP address (the IP address of console server 320) are detected. Console server 320 may further include an application program identified as emulator 324 that is responsible for enabling communication with the remote server appliances and for interpreting the serial data in each packet received from a server appliance.

Please replace the paragraph beginning at page 7, line 11, with the following:

Q⁷ Emulator 324 typically has a serial portion that includes the serial communication features of a standard serial communication emulator (such as the *minicom* emulator) that enables a device to communicate with a host over a serial line. These serial communication features of emulator 324 understand the serial protocol and control sequences that the server appliance uses to communicate with a console device attached to its serial port. In addition,